

# Work Order ID 54920



Page 1

January 5, 2010 9:48:00 AM

Item ID: D206-642-241

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 05/01/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 18/01/2010 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: *PL*

Date: 10-1-05 Tooling:

Date:

QC:

Date: SPC (Y/N):

Date:

Stop



| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Draw<br>Number | Draw<br>Rev. | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|----------------|--------------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|----------------|--------------|--------------|---------------|---------------|------------------|----------------|

| Draw Nbr | Revision Nbr |
|----------|--------------|
| D2650    | Rev F        |

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPP D206-642-241

CHG003 005

N/A *RJ*

110

0.00



Skidtubes

Skidtubes

Memo

0.00

Skidtubes

1-Deburr Fwd edge of tube. 2- Remove ridge on inside of Fwd edge of tube as per Dwg D2650. 3-Weld Fwd Cap as per Dwg D2650. Use aluminum rod. Grind D2647 to fit as required. Pick: Qty Part Number Description Batch A/R Aluminum Rod 4-G

120

0.00



QC6- Inspect dimensions to drawing

QC

Memo

0.00

Quality Control

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Routing Print

January 7, 2010 10:52:19 AM

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| Routing Seq ID/<br>Description/Memo  | Work Center ID | Tool Kit/Tape                   | Std Process ID/<br>Description | Yield<br>% | Queue<br>Time | Setup<br>Time | Machine<br>Time | Labor<br>Time | Move<br>Time | Var. Outpl/<br>Outpl. LT |
|--|----------------|---------------------------------|--------------------------------|------------|---------------|---------------|-----------------|---------------|--------------|--------------------------|
| Item ID: D206-642-241  |                | Item Name: Replacement Skidtube |                                |            |               |               |                 |               |              |                          |
| Routing Type: Production   |                |                                 |                                |            |               |               |                 |               |              |                          |
| 100  | DC             |                                 |                                | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| DOCUMENT   |                |                                 |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       |                          |
| CONTROL  |                |                                 |                                |            |               |               |                 |               |              |                          |
| Photocopy bluefile & type labels per PPP D206-642-241 CHG005   |                |                                 |                                |            |               |               |                 |               |              |                          |
| Total for Routing Sequence [ 100] :  |                |                                 |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 110  | Skidtubes      |                                 |                                | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Skidtubes  |                |                                 |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       |                          |
| 1-Deburr Fwd edge of tube BE 10/01/07  |                |                                 |                                |            |               |               |                 |               |              |                          |
| 2- Remove ridge on inside of Fwd edge of tube as per Dwg D2650 BE 10/01/07   |                |                                 |                                |            |               |               |                 |               |              |                          |
| 3-Weld Fwd Cap as per Dwg D2650. Use aluminum rod. Grind D2647 to fit as required.   |                |                                 |                                |            |               |               |                 |               |              |                          |
| Pick:  |                |                                 |                                |            |               |               |                 |               |              |                          |
| Qty : Part Number[ ] Description[ ] Batch  |                |                                 |                                |            |               |               |                 |               |              |                          |
| A/R[ ] Aluminum Rod[ ] M112860/M112507 BE 10/01/14   |                |                                 |                                |            |               |               |                 |               |              |                          |
| 4-Grind weld flush to cap on top surface only. BE 10/01/14   |                |                                 |                                |            |               |               |                 |               |              |                          |
| 5-Cut Aft end as per dwg 2650 from front of tube and Deburr  |                |                                 |                                |            |               |               |                 |               |              |                          |
| 6-Remove inner indexing ridge on Aft end of skidtube as per Dwg D2650  |                |                                 |                                |            |               |               |                 |               |              |                          |
| 7-Open holes for Aft end cap as per Dwg D2650 with #30 Drill Bit using DT8025.   |                |                                 |                                |            |               |               |                 |               |              |                          |
| 8-Drill pilot holes using Dt 8167.   |                |                                 |                                |            |               |               |                 |               |              |                          |
| 9-Locate DT8732 from inner Aft saddle hole & 3rd crossbolt hole. Insert D3286-1 doubler using DT8732 & D206-642-241-T1, then locating doubler off of 3/16" holes, cleco DT8732 & doubler leaving DT8732 for added support. |                |                                 |                                |            |               |               |                 |               |              |                          |
| 10- Drill D3286-1 doubler rivet holes in tube using # 30 drill, spot drilling doubler at the same time.  |                |                                 |                                |            |               |               |                 |               |              |                          |
| 11-Working from the center out, drill # 30 holes into D3286-1 doubler. Cleco each hole as it is being drilled. Verify angle of holes to accommodate rivet heads.   |                |                                 |                                |            |               |               |                 |               |              |                          |
| 12-Remove 3/16" cleco's only and open GHW holes to Ø0.500" as per Dwg D2650  |                |                                 |                                |            |               |               |                 |               |              |                          |
| 13-Remove D3286-1 doublers, identify orientation, deburr, then attach them to the workorder  |                |                                 |                                |            |               |               |                 |               |              |                          |
| 14-Remove indexing edge using DT8741 as per Dwg D2650  |                |                                 |                                |            |               |               |                 |               |              |                          |
| 15-C'sink GHW rivet holes as per Dwg D2650 K 10/11/18  |                |                                 |                                |            |               |               |                 |               |              |                          |
| Total for Routing Sequence [ 110] :  |                |                                 |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |

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| Routing Seq ID/<br>Description/Memo  | Work Center ID | Tool Kit/Tape | Std Process ID/<br>Description                | Yield<br>% | Queue<br>Time | Setup<br>Time | Machine<br>Time | Labor<br>Time | Move<br>Time | Var. Outpl/<br>Outpl. LT |
|--|----------------|---------------|---|------------|---------------|---------------|-----------------|---------------|--------------|--------------------------|
| 120  | QC             |               | QC6   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|  |                |               | QC6- Inspect<br>dimensions to<br>drawing      | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Total for Routing Sequence   120  :  |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 130  | Skidtubes      |               |   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Skidtubes  |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 1-Open crossbolt holes to Ø0.3125"   |                |               |   |            |               |               |                 |               |              |                          |
| 2-Drill pilot holes using DT8028-3, then open to Ø0.297" as per Dwg D2650. Open Aft cap hole #6. |                |               |   |            |               |               |                 |               |              |                          |
| 3-Deburr tube and blow out chips from inside the tube  |                |               |   |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   130  :  |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 140  | HandFinish     |               | HandFinish1                                   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|  |                |               | Chemical<br>Conversion Coat<br>per QSI005 4.1 | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Total for Routing Sequence   140  :  |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 150  | QC             |               | QC3   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|  |                |               | QC3- Inspect Part<br>Finish                   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Total for Routing Sequence   150  :  |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 160  | Skidtubes      |               |   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Skidtubes  |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 1-Open holes to finished size as per Dwg D2650, D2650-3 Drilling Detail (without cutting fluid)  |                |               |   |            |               |               |                 |               |              |                          |
| 2-C'sink crossbolt spacer holes as per Dwg D2650(without cutting fluid)                          |                |               |   |            |               |               |                 |               |              |                          |
| 3-Deburr and blow out all chips from inside the tube   |                |               |   |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   160  :  |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 170  | QC             |               | QC6   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|  |                |               | QC6- Inspect<br>dimensions to<br>drawing      | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Total for Routing Sequence   170  :  |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |

Sc 10/1/19

H 10/1/19

H 10/1/20

AE 10/01/20

H 10/1/20

Sc 10/1/20

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| Routing Seq ID/<br>Description/Memo | Work Center ID | Tool Kit/Tape | Std Process ID/<br>Description | Yield<br>% | Queue<br>Time | Setup<br>Time | Machine<br>Time | Labor<br>Time | Move<br>Time | Var. Outpl/<br>Outpl. LT |
|-------------------------------------|----------------|---------------|--------------------------------|------------|---------------|---------------|-----------------|---------------|--------------|--------------------------|
| 180                                 | Skidtubes      |               |                                | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Skidtubes                           |                |               |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       |                          |

1-Locate, install and rivet doublers as per Dwg D2650. Micro-shave rivets as required

2-Bond D2654-3 web in place as per QSI 015. Ensure holes line up. Allow 12 Hrs. cure time before cutting

Start Date: 10/1/20 Time: 3:00

Finish Date: 10/1/21 Time: 8:45am

Pick:

Qty: Part Number Description Batch

A/R: Sikaflex-291 1712395

Sikaflex expire date: 10/8/30

10/1/20

|     |    |   |         |        |        |        |        |        |        |
|-----|----|---|---------|--------|--------|--------|--------|--------|--------|
|     |    | Total for Routing Sequence   180  :           |         | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 190 | QC | QC5   | 100.00% | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
|     |    | QC5- Inspect part completeness to step on W/O | 100.00% | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |        |

8.6.121

|           |           |  |                                     |        |        |        |        |        |        |
|-----------|-----------|--|-------------------------------------|--------|--------|--------|--------|--------|--------|
|           |           |  | Total for Routing Sequence   190  : | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 200       | Skidtubes |  | 100.00%                             | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Skidtubes | /         |  |                                     | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |        |

1-remove alodine from around hole and prepare for welding

BE 10/01/21

2-Prep per QSI 005 and Insert D2649 crossbolt spacers. Weld as per QSI 004 and Dwg D2650. Remember to back drill each hole to 0.25" before welding the other side. Use aluminum rod.

Pick:

Qty: Part Number Description Batch

A/R: Aluminum Rod 1112507

BE 10/01/21

3-Grind welds flush as per Dwg D2650.

4-Using DT8733, insert (2) D3286-3 spacers as per QSI 004 and Dwg D2650. Remember to back drill each hole to Ø0.402" before welding other side. Use SS rod as required.

A/R: SS Rod 1100E

BE 10/01/21

5-Counterbore 5/16" x 0.750" deep except 7th hole from Aft end as per Dwg D2650. Deburr

10/1/25

|               |            |  |                                      |        |        |        |        |        |        |
|---------------|------------|--|--------------------------------------|--------|--------|--------|--------|--------|--------|
|               |            |  | Total for Routing Sequence   200   : | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 210           | HandFinish |  | 100.00%                              | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| HandFinishing |            |  |                                      | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |        |

Install D2680-041 Nut Plate as per Dwg D2650

|                                      |  |  |  |        |        |        |        |        |        |
|--------------------------------------|--|--|--|--------|--------|--------|--------|--------|--------|
| Total for Routing Sequence   210   : |  |  |  | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
|--------------------------------------|--|--|--|--------|--------|--------|--------|--------|--------|

10/1/25

# Routing Print

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| Routing Seq ID/<br>Description/Memo | Work Center ID | Tool Kit/Tape     | Std Process ID/<br>Description | Yield<br>% | Queue<br>Time | Setup<br>Time | Machine<br>Time | Labor<br>Time | Move<br>Time | Var. Outpl/<br>Outpl. LT |
|-------------------------------------|----------------|-------------------|--------------------------------|------------|---------------|---------------|-----------------|---------------|--------------|--------------------------|
| 220                                 | QC             |                   | QC9                            | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|                                     |                | QCA → PD 10.01.26 | QC9- Inspect visual            | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       |                          |
|                                     |                | QC10 → 8.10.11/26 | per QSI004- Fusion<br>Welds    |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   220  : |                |                   |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 230                                 | QC             |                   | QC5                            | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|                                     |                |                   | QC5- Inspect part              | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       |                          |
|                                     |                |                   | completeness to<br>step on W/O |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   230  : |                |                   |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 240                                 | HandFinish     |                   | HandFinish2                    | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|                                     |                |                   | Pressure Wash per              | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       |                          |
|                                     |                |                   | QSI005 4.3                     |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   240  : |                |                   |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 250                                 | Powdercoat     |                   | Powdercoat1                    | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|                                     |                |                   | White                          | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       |                          |
|                                     |                |                   | Gloss(Ref.4.3.5.1)             |            |               |               |                 |               |              |                          |
|                                     |                |                   | per QSI005 4.3-<br>Alum        |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   250  : |                |                   |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 260                                 | QC             |                   | QC3                            | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|                                     |                |                   | QC3- Inspect Part              | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       |                          |
|                                     |                |                   | Finish                         |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   260  : |                |                   |                                |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |

M113170

START TIME: 11:30AM  
OVEN TEMPERATURE: 32095  
FINISH TIME: 12:00PM

⇒ M

10-01-26

(X)

BR 10-01-26

①

BR 10-01-28

①

# Routing Print

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| Routing Seq ID/<br>Description/Memo  | Work Center ID | Tool Kit/Tape | Std Process ID/<br>Description                | Yield<br>% | Queue<br>Time | Setup<br>Time | Machine<br>Time | Labor<br>Time | Move<br>Time | Var. Outpl/<br>Outpl. LT |
|--|----------------|---------------|---|------------|---------------|---------------|-----------------|---------------|--------------|--------------------------|
| 270<br>HandFinishing   | HandFinish     |               |   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 1- Install inserts & wearpads as per dwg D2922. Use a drop of Sikaflex inside insert holes before installing wearpad/wearplate.<br>A/R: Sikaflex-291 <u>112845</u><br>Sikaflex expire date: <u>10/08</u> |                |               |   |            |               |               |                 |               |              |                          |
| 2-Install D2651-3 O-Rings on D2651-1 plugs with Petroleum Jelly and install plugs as per Dwg D2650 (D2650-3 detail). Clean excess adhesive.  |                |               |   |            |               |               |                 |               |              |                          |
| 3-Install MS27039-4-06 Screw as per DEO 9153.  |                |               |   |            |               |               |                 |               |              |                          |
| 4 -Install D2646 Aft Cap and seal with Sikaflex. Clean excess adhesive<br>A/R: Sikaflex-291 <u>112845</u><br>Sikaflex expire date: <u>10/08</u>  |                |               |   |            |               |               |                 |               |              |                          |
| 5 -Wing Walk as per Dwg D2650-3 and QSI 005 4.4<br>A/R Batch: <u>M 113545</u><br>Batch: <u>M 113545</u>  |                |               |   |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   270   :   |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 300  | QC             |               | QC5   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|  |                |               | QC5- Inspect part completeness to step on W/O | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Total for Routing Sequence   300   :   |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 310  | Packaging      |               |   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Packaging  |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Identify and pack for shipping as per PPP D206-664-241   |                |               |   |            |               |               |                 |               |              |                          |
| Location: _____  |                |               |   |            |               |               |                 |               |              |                          |
| PPP Rev: _____   |                |               |   |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   310   :   |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| 320  | QC             |               | QC21  | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|  |                |               | QC21- Final                                   | 100.00%    | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
|  |                |               | Inspection - Work Order Release               |            |               |               |                 |               |              |                          |
| Total for Routing Sequence   320   :   |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |
| Total for Alternate Route [Production] of Item [D206-642-241]:   |                |               |   |            | 0.0000        | 0.0000        | 0.0000          | 0.0000        | 0.0000       | 0.0000                   |

bl 10-a-28 ①

IX

8/10/12/3

10/02/04





| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                                |                                 |                |                           |                       |                          |
|------|------|----------------------------------|--------------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action<br>Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng           | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

**Work Order ID 54920**

Page 3

January 5, 2010 9:48:00 AM

Item ID: D206-642-241

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 05/01/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 18/01/2010 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

160



Skidtubes

0.00

Skidtubes

Memo

0.00

Skidtubes

1-Open holes to finished size as per Dwg D2650, D2650-3 Drilling Detail  
(without cutting fluid) 2-C'sink crossbolt spacer holes as per Dwg  
D2650 (without cutting fluid) 3-Deburr and blow out all chips from inside the  
tube

170



QC6- Inspect dimensions to drawing

0.00

QC

Memo

0.00

Quality Control

180



Skidtubes

0.00

Skidtubes

Memo

0.00

Skidtubes

1-Locate, install and rivet doublers as per Dwg D2650. Micro-shave rivets as  
required 2-Bond D2654-3 web in place as per QSI 015. Ensure holes line  
up. Allow 12 Hrs. cure time before cutting. Start  
Date: \_\_\_\_\_ Time: \_\_\_\_\_ Finish Date: \_\_\_\_\_ Time

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

NOTE: Date & initial all entries

# Work Order ID 54920

January 5, 2010 9:48:00 AM



Page 4

Item ID: D206-642-241

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 05/01/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 18/01/2010 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

190

QC5-Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

200

Skidtubes

0.00



Skidtubes

Memo

0.00

Skidtubes

1-remove alodine from around hole and prepare for welding  
2-Insert D2649 crossbolt spacers. Weld as per QSI 004 and Dwg D2650. Remember to back drill each hole to 0.25" before welding the other side. Use aluminum rod.  
Pick: QtyPart NumberDescriptionBat

210

HandFinishing

0.00



HandFinish

Memo

0.00

Hand Finishing

Install D2680-041 Nut Plate as per Dwg D2650

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                                |                                 |                |                           |                       |                          |
|------|------|----------------------------------|--------------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action<br>Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng           | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Work Order ID 54920



Page 5

January 5, 2010 9:48:00 AM

Item ID: D206-642-241

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 05/01/2010 Start Qty: 1.00



Cost Item ID:

Required Date: 18/01/2010 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

220

QC9- Inspect visual per QSI004- Fusion Welds

0.00



QC

Memo

0.00

Quality Control

230

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

240

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

**Work Order ID 54920**

Page 6

January 5, 2010 9:48:00 AM

Item ID: D206-642-241

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 05/01/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 18/01/2010 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

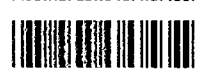
Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

250



Powdercoat

Powder Coating

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00

Memo

0.00

START TIME:

OVEN TEMPERATURE:

FINISH TIME

260



QC

Quality Control

QC3- Inspect Part Finish

0.00

Memo

0.00

270



HandFinish

Hand Finishing

HandFinishing

0.00

Memo

0.00

1- Install inserts & wearpads as per dwg D2922. Use a drop of Sikaflex inside insert holes before installing wearpad/wearplate. A/RSikaflex-291  
Sikaflex expire date: \_\_\_\_\_  
2-Install D2651-3 O-Rings on D2651-I plugs with Petroleum



| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Work Order ID 54920

January 5, 2010 9:48:01 AM



Page 7

Item ID: D206-642-241

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 05/01/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 18/01/2010 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

280

0.00



HandFinishing

HandFinish

Memo

0.00

Hand Finishing

1-Install D2646 Aft Cap and seal with Sikaflex. Clean excess adhesive

□

A/RSikaflex-291 \_\_\_\_\_ Sikaflex expire date: \_\_\_\_\_ □2-

Wing Walk as per Dwg D2650-3 and QSI 005 4.4 Batch: \_\_\_\_\_

290

0.00



QC3- Inspect Part Finish

QC

Memo

0.00

Quality Control

300

0.00



QC5- Inspect part completeness to step on W/O

QC

Memo

0.00

Quality Control

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                       |                          |
|------|------|--------------------|----|------|-----|---------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>* Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                       |                          |
|      |      |                    |    |      |     |                                       |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Work Order ID 54920

January 5, 2010 9:48:01 AM

Page 8

Item ID: D206-642-241

Accept

Setup Start

Revision ID:

Stop

Item Name: Replacement Skidtube

Start Date: 05/01/2010 Start Qty: 1.00

Cust Item ID:

Required Date: 18/01/2010 Req'd Qty: 1.00

Customer:

Reference:

Run Start

Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop

QC:

Date:

SPC (Y/N):

Date:

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

310

Packaging

0.00

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D206664241 IF  
APPLICABLE Location: \_\_\_\_\_ PPP Rev: \_\_\_\_\_

PPP 54906

16-2-3

320

QC21- Final Inspection - Work Order Release

0.00

QC

Memo

0.00

Quality Control

10/02/04

MR

10-2-4

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

# Single-Level Bill

January 7, 2010 10:55:24 AM

Page 1 of 2

Criteria : Item ID: d206-642-241, All Product Families, All Item Types, All Categories, All Buyers/Planners, Effective Start Date: 1/07/10.

Single Level Bill of Material Standard Report As of: 1/07/10

Parent Item ID D206-642-241

Unit Measure Each

Replacement Item ID

Item Name Replacement Skidtube

| Item ID             | Item Name              | Replacement Item ID | Qty/ Assy | Unit Measure | Eff. Start Date | Eff. Stop Date       |
|---------------------|------------------------|---------------------|-----------|--------------|-----------------|----------------------|
| BOM Type Production |                        |                     |           |              |                 |                      |
| D3286-1             | Doubler                |                     | 2.0000    | Each         | 12/05/09        | B47692 ② H 10/1/12   |
| D2647               | Cap                    |                     | 1.0000    | Each         | 12/05/09        | B55352 BE 10/1/14    |
| D2600-1-160         | Extrusion Round 3" 206 |                     | 1.0000    | Each         | 1/07/10         |                      |
| D2654-3             | Web                    |                     | 1.0000    | Each         | 12/05/09        | B54448 BE 10/01/07   |
| CR3212-4-04         | Cherry Rivet           |                     | 52.0000   | Each         | 1/01/08         | B55041 H 10/1/12     |
| D2649               | Cross Bolt Spacer      |                     | 18.0000   | Each         | 12/05/09        | M112314 H 10/1/12    |
| D3286-3             | Spacer                 |                     | 2.0000    | Each         | 12/05/09        | B51529 ④ BE 10/01/21 |
| D2680-041           | Nut Plate              |                     | 1.0000    | Each         | 12/05/09        | B46643 ② BE 10/01/21 |
| CR3212-4-03         | Cherry Rivet           |                     | 2.0000    | Each         | 1/01/08         | B55366 ① H 10/1/12   |
| CCR264SS3-3         | Cherry Rivet           |                     | 2.0000    | Each         | 1/01/08         | M110129 ② H 10/1/12  |
| D2646               | Aft Cap                |                     | 1.0000    | Each         | 12/05/09        | M113539 ② H 10/1/12  |
| D2651-1             | Plug                   |                     | 18.0000   | Each         | 12/05/09        | BR 10-01-28          |
| AN960JD416          | Washer                 |                     | 1.0000    | Each         | 1/01/08         | BR 10-01-28          |
| D2651-3             | O-Ring                 |                     | 18.0000   | Each         | 12/05/09        | BR 10-01-28          |
| MS27039-1-08        | Screw                  |                     | 46.0000   | Each         | 1/01/08         | BR 10-01-28          |
| ALS4-1032-130       | Insert                 |                     | 44.0000   | Each         | 1/01/08         | BR 10-01-28          |
| MS27039-4-06        | Screw                  |                     | 1.0000    | Each         | 1/01/08         | BR 10-01-28          |
| AN960JD10L          | Washer                 |                     | 46.0000   | Each         | 1/01/08         | BR 10-01-28          |
| D3537-1             | Wearpad                |                     | 4.0000    | Each         | 1/07/10         | BR 10-01-28          |

## Single Level Bill of Material Standard Report

As of:

1/07/10

Parent Item ID D206-642-241

Unit Measure Each

Replacement Item ID

Item Name Replacement Skidtube

| Item ID  | Item Name | Replacement Item ID | Qty/ Assy | Unit Measure | Eff. Start Date | Eff. Stop Date |
|----------|-----------|---------------------|-----------|--------------|-----------------|----------------|
| D3537-3  | Wearpad   | 35697               | 1         | 1.0000       | Each            | 1/07/10        |
| D3535-13 | Wearshoe  | 37584               | 1         | 1.0000       | Each            | 1/07/10        |
| D3536-13 | Gasket    | 38761               | 1         | 1.0000       | Each            | 1/07/10        |
| D3535-21 | Wearshoe  | 37624               | 1         | 1.0000       | Each            | 1/07/10        |
| D3536-21 | Gasket    | 47010               | 1         | 1.0000       | Each            | 1/07/10        |
| D3535-33 | Wearshoe  | 51647               | 1         | 1.0000       | Each            | 1/07/10        |
| D3536-33 | Gasket    | 51593               | 1         | 1.0000       | Each            | 1/07/10        |

Bl 10-01-28.

| QTY<br>-1 | QTY<br>-3 | QTY<br>-5 | QTY<br>-7 | PART NUMBER   | DESCRIPTION   |
|-----------|-----------|-----------|-----------|---------------|---|
| X         |           |           |           | D2650-1       | SKIDTUBE ASSEMBLY                                       |
|           | X         |           |           | D2650-3       | SKIDTUBE ASSEMBLY                                       |
|           |           | X         |           | D2650-5       | SKIDTUBE ASSEMBLY                                       |
|           |           |           | X         | D2650-7       | SKIDTUBE ASSEMBLY                                       |
| 1         | 1         | 1         | 1         | D2600-1-150   | EXTRUSION   |
| 1         |           |           |           | D2654-1       | WEB   |
|           | 1         |           |           | D2654-3       | WEB   |
|           |           | 1         |           | D2654-5       | WEB   |
|           |           |           | 1         | D2654-7       | WEB   |
| 1         | 1         | 1         | 1         | D2645         | AFT CAP   |
| 1         | 1         | 1         | 1         | D2647         | CAP   |
| 17        | 18        | 19        | 23        | D2649         | CROSS BOLT SPACER                                       |
| 16        | 18        | 14        | 22        | D2651-1       | PLUG  |
| 16        | 18        | 14        | 22        | D2651-3       | O-RING  |
| 1         | 1         | 1         | 1         | D2680-041     | NUT PLATE   |
| 2         | 2         |           |           | D3286-1       | DOUBLER   |
| 2         | 2         |           |           | D3286-3       | STUD  |
| 42        | 44        | 54        | 60        | ALS7-1032-130 | INSERT (or AKS4-1032-130, ALS4-1032-130, ALS7-1032-130) |
| 2         | 2         | 2         | 2         | AN960JD10L    | WASHER  |
| 2         | 2         | 2         | 2         | CCR264SS3-3   | RIVET   |
| 2         | 2         | 2         | 2         | CR3212-4-03   | RIVET   |
| 2         | 2         | 2         | 2         | MS27039-1-08  | SCREW   |
| 1         | 1         | 1         | 1         | MS27039-4-06  | SCREW   |
| 1         | 1         | 1         | 1         | AN960JD416    | WASHER  |
| 52        | 52        |           |           | CR3212-4-04   | RIVET   |

F

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 54920  
BT10-1-05

RELEASED  
08-07-23

F

NOTES:  
MATERIAL: N/A  
FINISH: -CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
-POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3  
-BLACK ANTI-SKID PAINT AS INDICATED TO 0.5 ABOVE LOCATION RIDGE PER DART QSI 005 4.4

TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED

UNITS: INCHES UNLESS OTHERWISE NOTED

BREAK SHARP EDGES: 0.005 TO 0.010 MAX

IDENTIFICATION: NONE

WEIGHT: N/A

WELD PER DART QSI 004

DAMAGE TOLERANCE ON FWD BEND:

THERE SHOULD BE NO VISIBLE WRINKLES IN THE BEND FROM THE GROUND TO A HEIGHT OF 5 INCHES ABOVE THE GROUND. IT IS ACCEPTABLE TO POLISH OUT GOUGES UP TO 0.020 DEEP IN THE BENT PORTION OF THE TUBE. A MAXIMUM REDUCTION IN DIAMETER OF 0.150" IS ACCEPTABLE IN THE BENT PORTION OF THE TUBE.

) BOND WEB INTO OUTER TUBE WITH SIKAFLEX-2411-291 ADHESIVE PER DART QSI 015

) INSERT D2651-1 PLUG CW D2651-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE)

) DRILL Ø0.297 FOR ALS7-1032-130 INSERTS USING TEMPLATE DT8056-1 ON -1 TUBE, DT8056-3 ON -3 TUBE, DT8056-5 ON -5 TUBE, AND DT8056-7 ON -7 TUBE. INSTALL INSERTS AFTER FINISH.

) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

|            |          |   |              |
|------------|----------|---|--------------|
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| DRAWN      | AJS      | PORT HADLOCK, WA  |              |
| CHECKED    |          | DRAWING NO.   | REV. F       |
| MFG. APPR. |          | D2650   | SHEET 1 OF 6 |
| APPROVED   |          | TITLE   | SCALE        |
| DE APPR.   |          | 206/407 SKIDTUBE ASSEMBLIES   | NTS          |
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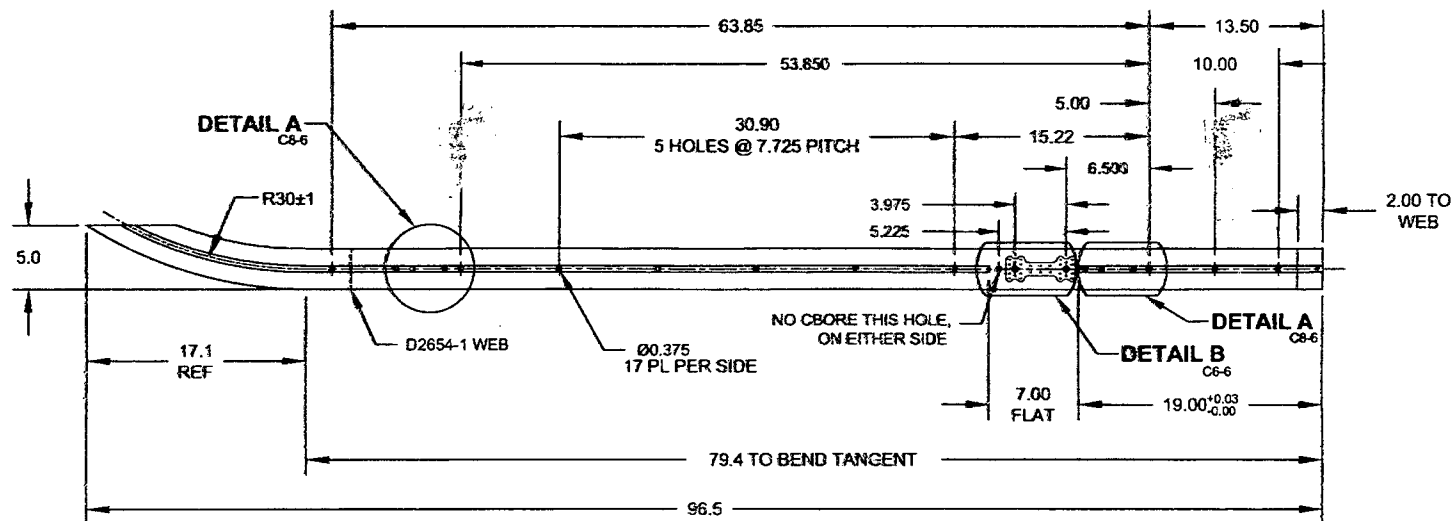
| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

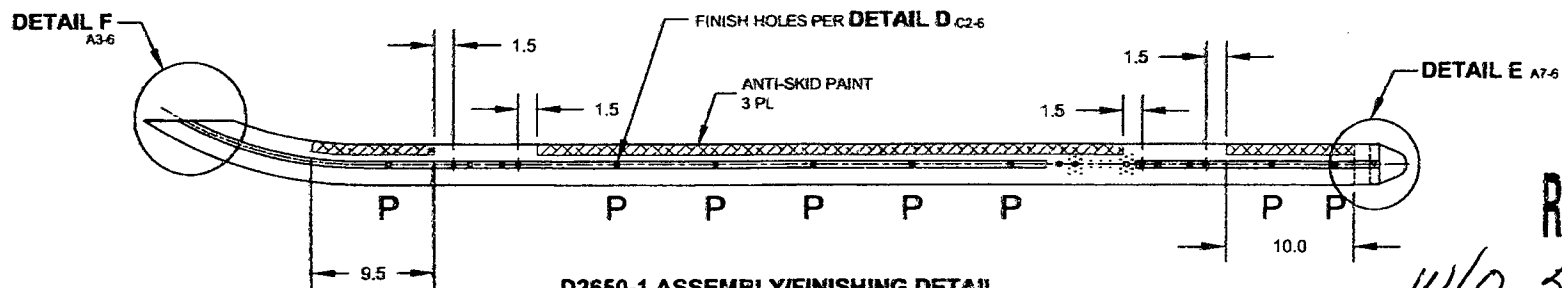
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries



**D2650-1 BENDING/DRILLING DETAIL**



**D2650-1 ASSEMBLY/FINISHING DETAIL**

**RELEASED**  
880712

W10 54920

|            |          |   |              |
|------------|----------|---|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE USA, INC</b>  |              |
| DRAWN      | AJS      | PORT HADLOCK, WA  |              |
| CHECKED    |          | DRAWING NO.   | REV. F       |
| MFG. APPR. |          | D2650   | SHEET 2 OF 6 |
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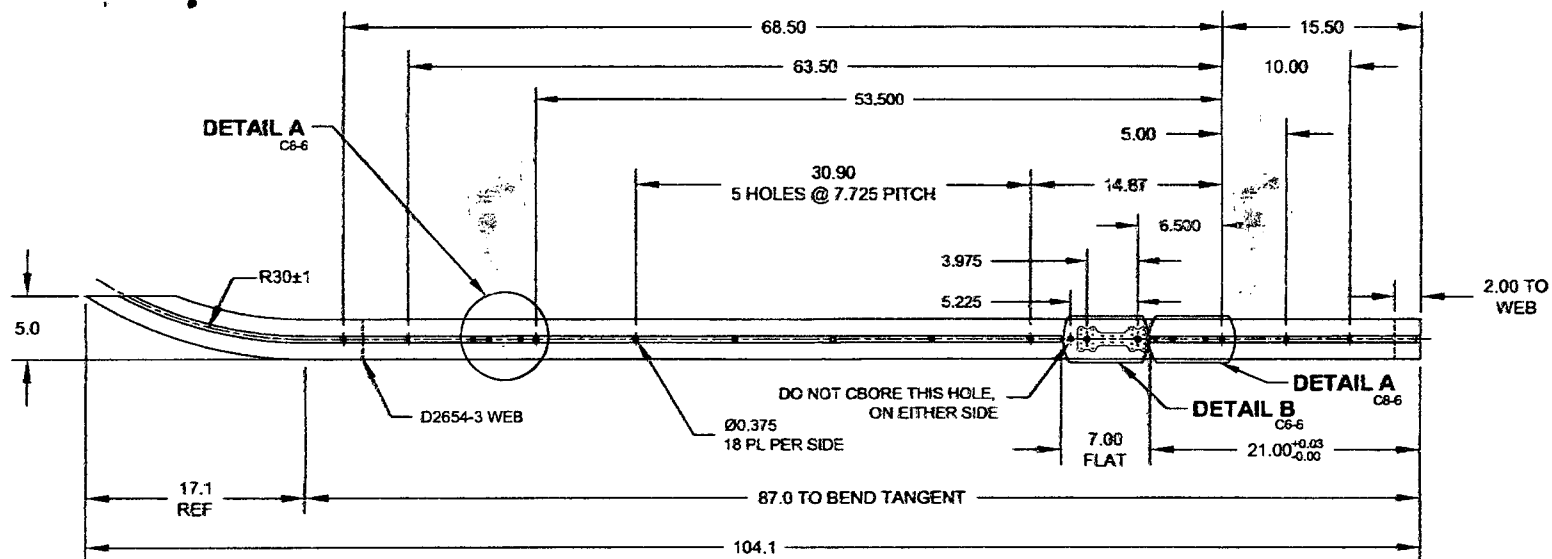
| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

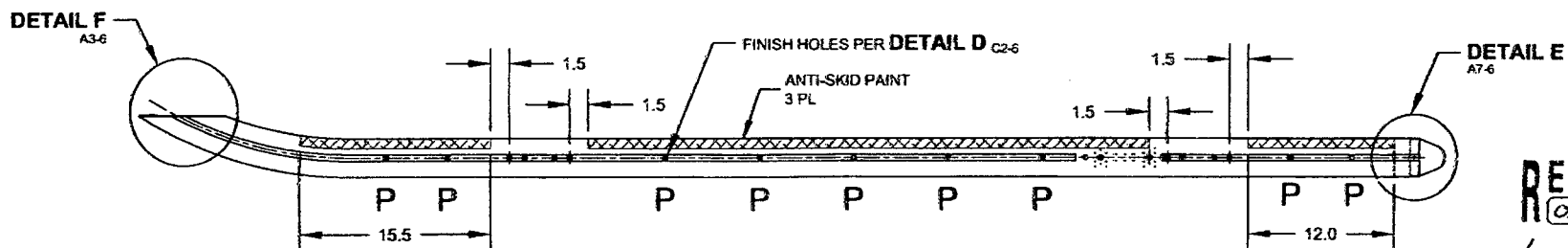
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

NOTE: Date & initial all entries



**D2650-3 BENDING/DRILLING DETAIL**



**D2650-3 ASSEMBLY/FINISHING DETAIL**

**RELEASED**  
05 07 22 1110

|            |          |   |              |
|------------|----------|---|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE USA, INC</b>  |              |
| DRAWN      | AJS      | PORT HADLOCK, WA  |              |
| CHECKED    |          | DRAWING NO.   | REV. F       |
| MFG. APPR. |          | D2650   | SHEET 3 OF 6 |
| APPROVED   |          | TITLE   | SCALE        |
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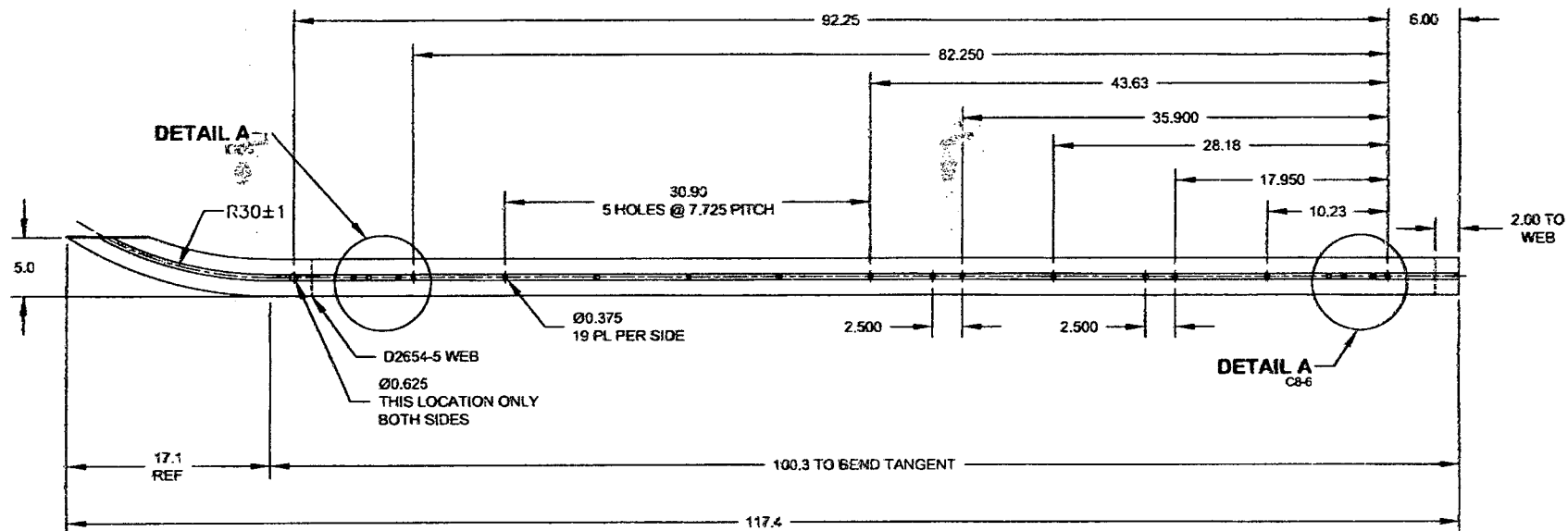
| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

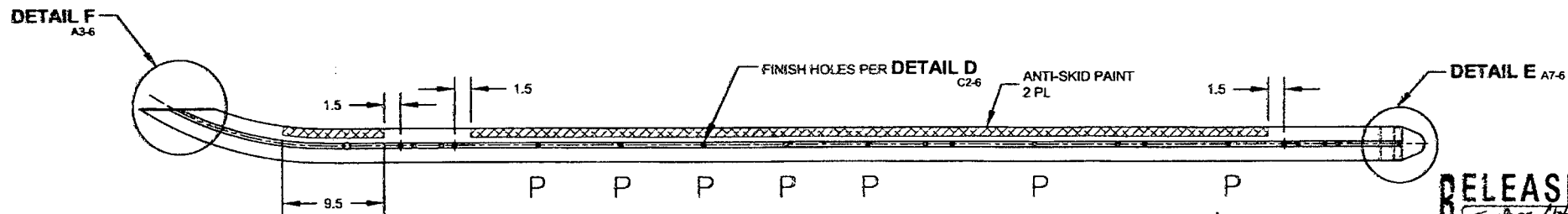
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries



**D2650-5 BENDING/DRILLING DETAIL**



**D2650-5 ASSEMBLY/FINISHING DETAIL**

*W/0 54920*

|            |                    |  |              |
|------------|--------------------|--|--------------|
| DESIGN     | DS                 | <b>DART AEROSPACE USA, INC</b>   |              |
| DRAWN      | AJS                | PORT HADLOCK, WA   |              |
| CHECKED    | <i>[Signature]</i> | DRAWING NO.  | REV. F       |
| MFG. APPR. | <i>[Signature]</i> | D2650  | SHEET 4 OF 6 |
| APPROVED   | <i>[Signature]</i> | TITLE  | SCALE        |
| DE APPR.   | <i>[Signature]</i> | 206/407 SKIDTUBE ASSEMBLIES  | NTS          |
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| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
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**NOTE:** Date & initial all entries





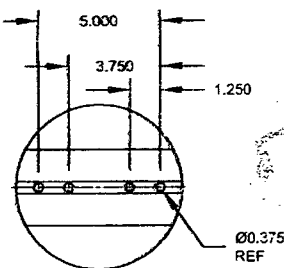
| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng./<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

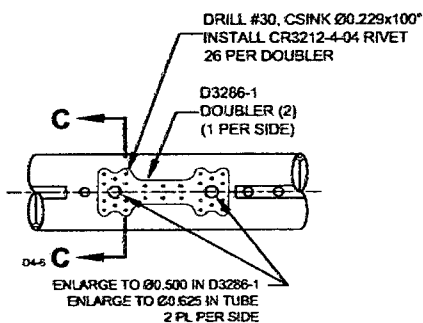
Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
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**NOTE:** Date & initial all entries

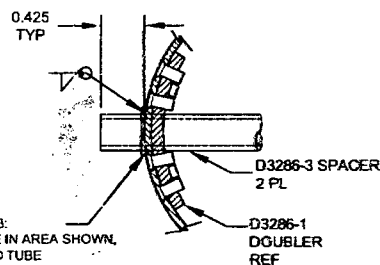


**DETAIL A** C2-2  
SCALE 2X D7-2  
C2-3  
D7-3  
C2-4  
D7-4  
C2-6  
D8-5

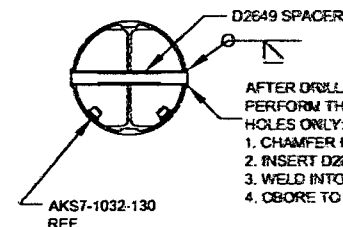


**DETAIL B** C3-2  
SCALE 2X C3-3

**SECTION C-C** C7-6  
SCALE NONE

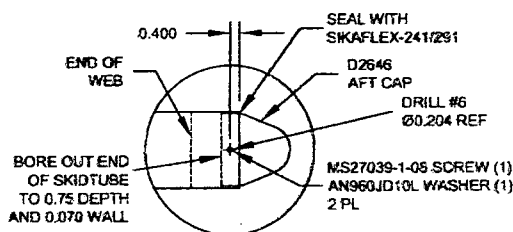


- TO INSTALL D3286-1A3:
1. GRIND OFF FLANGE IN AREA SHOWN, FLUSH WITH ROUND TUBE
  2. LOCATE & DRILL D3286-1 DOUBLER USING DT3295-1T1
  3. ENLARGE HOLES IN D3286-1 TO Ø0.500
  4. ENLARGE HOLES IN TUBE TO Ø0.625 AND CHAMFER HOLE 0.030x45°
  5. RIVET D3286-1 TO TUBE
  6. INSERT D3286-3 SPACER
  7. WELD IN PLACE.

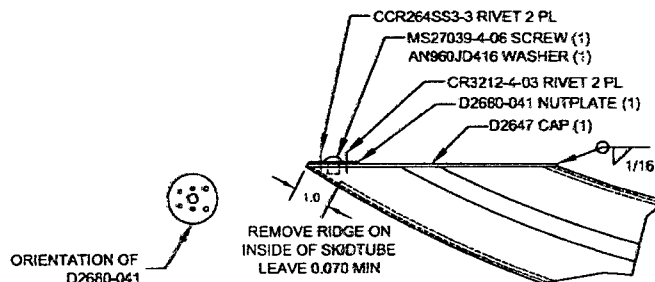


- AFTER DRILLING AND FINISHING ASSEMBLY PERFORM THE FOLLOWING FOR Ø0.375 HOLES ONLY:
1. CHAMFER HOLE 0.030 X 45°
  2. INSERT D2649 SPACER
  3. WELD INTO PLACE AND GRIND FLUSH
  4. OBORE TO Ø0.313 X 0.75 DP

**DETAIL D** B4-2  
FOR Ø0.375 HOLES ONLY B4-3  
SCALE 3X B4-4  
B4-5



**DETAIL E** B2-2  
SCALE 2X B2-3  
B1-4  
B1-5



**DETAIL F** B8-2  
SCALE NONE B8-3  
B8-4  
B8-5

- DETAIL F NOTES:**
1. CUT TUBE LEVEL
  2. REMOVE RIDGE ON PWD SIDE
  3. LOCATE D2647 (TRIM AS NECESSARY)
  4. WELD D2647 IN PLACE PER DART QSI 004
  5. GRIND FLUSH
  6. RIVET D2680-041 NUT PLATE IN PLACE

NOTE: MASK THREADS IN D2680-041 PRIOR TO FINISH

**RELEASED**  
05-09-22-13

*W/0 54920*

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| DRAWN      | AJS      | PORT HADLOCK, WA  |              |
| CHECKED    |          | DRAWING NO.   | REV. F       |
| MFG. APPR. |          | D2650   | SHEET 6 OF 6 |
| APPROVED   |          | TITLE   | SCALE        |
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| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
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| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

NOTE: Date & initial all entries

NO. 216

AWS D17.1.2001  
QUALIFICATION TEST RECORD

Name: Barclay Elliott  
Job number: D206 52867  
Part number: D206 642-541  
Description: 206 skid  
Welding Process: Tig[☒] Mig[ ]  
Base material: Aluminium  
Current: AC[☒] DC[ ]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[ ]  
Penetration: pass[☒] fail[ ]

UNACCEPTABLE

Cracks: pass[☒] fail[ ]  
Undercut: pass[☒] fail[ ]  
Pin holes: pass[☒] fail[ ]  
Overlap (cold lap): pass[☒] fail[ ]  
Porosity (surface): pass[☒] fail[ ]  
Coloration: pass[☒] fail[ ]

Qualifier P. J. D. S. Date of Test Coupon 09-11-10  
Welder Barclay Elliott Date of Test Coupon 09-11-10

The above named individual is qualified in accordance with AWS D17.1.2001 to weld